



GARNET

(Global Alert/Resolution
NETWORK)

Compared to Other Alert Systems

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June 2005



GARNET Compared to Other Alert Systems



- Extensive studies/comparisons were done comparing GARNET to the followings systems:
 - Leading instant messaging commercial application
 - Leading emergency alert commercial application
 - E-mail



GARNET Compared to Other Alert Systems



GARNET Pros

- GARNET can simultaneously utilize multiple notification mediums such as desktop, E-mail, phones, closed-circuit television, pagers, and PDA's
- GARNET is an IT based system that can be expanded to meet the needs of the future.
- GARNET is an effective way to rapidly alert **ALL** affected people in an emergency, whether they are at their desks, in a meeting, in the hallway, or in the bathroom.
- GARNET provides detailed alert information
- GARNET requires a person to acknowledge an alert. This quality is advantageous for a notification mechanism because we know users will receive and must acknowledge a critical alert.
- GARNET is a framework that allows for alerts to be targeted to the affected/interested people without worrying about exactly who should get notified in the time of an emergency.
- Categories and severity information are pre-defined to only notify those people who are affected by the alert.
- Alert creations can be automatic therefore making information flow time effective.
- Contingency plan for network failure
- Archival of historical alerts and logs



GARNET Compared to Other Alert Systems



- Advantages of Other Systems

- Proven Reliability
- Moderate to low cost
- The Alert systems that we examined can be an effective way to contact people who have installed the client on their desktop and alerts can be provided in near real-time to those who can receive multicast messages.
- Users are unable to use their desktop computers without first acknowledging a critical alert.
- Critical alerts can not be hidden.



GARNET Compared to Other Alert Systems



- Disadvantages of Other Systems

- Messages are multicast to users and messages and many Center Networks (including GSFC) prohibit the use of multicasting.
- E-mail must be checked at the user's convenience, which is not effective during critical situations.
- Everyone is not notified during critical situations if they are not sitting at their desk reading e-mail.
- Standard Alerts would be generated going to people who are not affected.
- People do not acknowledge an e-mail alert, so there is low confidence that the desired people received the critical information.
- Alert creations are generated manually and information flow may not be time effective.
- E-mail system is a single point of failure.
- Messages are not guaranteed to be delivered.



Comparison Details- 1



<p align="center"><u>GARNET</u> (Global Alert Resolution NETWORK)</p>	<p align="center"><u>Leading IM Commercial App</u></p>	<p align="center">Other Govt Apps</p>
<ul style="list-style-type: none"> • Near Real-Time Capabilities <ul style="list-style-type: none"> – GARNET is an effective way to rapidly alert ALL affected people in an emergency in near real-time, whether they are at their desks, in a meeting, in the hallway, or in the bathroom. 	<ul style="list-style-type: none"> • Non-real time Capabilities. <ul style="list-style-type: none"> – Not designed to be a near real-time system. 	<ul style="list-style-type: none"> • Near Real-Time Capabilities <ul style="list-style-type: none"> –The Alert system will be an effective way to contact people who have installed the client on their desktop and will provide alerts in near real-time.
	<ul style="list-style-type: none"> • COTS product that needs to be purchased and install on all workstations. A timely and high cost system implementation. 	<ul style="list-style-type: none"> • Existing S/W Not Deployed at GSFC <ul style="list-style-type: none"> –The s/w does presently exist.
<p>Multiple notification mediums; can be obtrusive</p> <ul style="list-style-type: none"> – GARNET can simultaneously utilize multiple notification mediums such as desktop, E-mail, phones, closed-circuit television, pagers, PDA’s, etc. –Users are unable to use their desktop computers without first acknowledging a critical alert. –Critical alerts can not be hidden. 	<ul style="list-style-type: none"> •Single Unobtrusive Notification Medium <ul style="list-style-type: none"> –User can turn off or pop-up mail, thus critical alerts can be missed. 	<ul style="list-style-type: none"> • Multiple notification mediums; can be obtrusive <ul style="list-style-type: none"> –This system is for internal use only and was designed to augment the PA system, not integrate with it. It would very difficult to add external interfaces. –Users are unable to use their desktop computers without first acknowledging a critical alert. –Critical alerts can not be hidden.



Comparison Details - 2



 <u>GARNET</u> (Global Alert Resolution NETWORK)	<u>Leading IM Commercial App</u>	<u>Other Govt Apps</u>
<p>•Unicast Networking</p> <ul style="list-style-type: none"> – GARNET utilizes a point-to-point delivery scheme which does not rely solely on internal or external network implementations. GARNET architecture provides for integrating a Contingency plan for network failure. Multiple notification mechanisms will reduce the effects of potential network problems. ▪GARNET is able to notify via desktop both inside and outside of a firewall. If inside firewall, GARNET pushes messages to the client. Notification is extremely fast in this scenario. If outside the firewall, client polls for new alerts. Poll frequency is configurable. These combined capabilities provide the most effective way to reduce bandwidth usage while providing a rich set of capabilities. 	<p>•Unicast Networking</p> <ul style="list-style-type: none"> – Messages are Unicast to users and messages are not guaranteed to be delivered via email. (reference GSFC announcement 03-24) 'E-mails take up to 4 hours to move from one part of the Center to another, in some cases e-mails being lost totally' ▪User reads E-mail at his/her leisure. ▪ User can setup filters. ▪User must have E-mail client running to receive message. ▪ Most E-mail clients poll to receive messages. Polling presents a time delay to receiving message. 	<p>•Unicast Networking</p> <ul style="list-style-type: none"> – Messages are Unicast to users and messages are not guaranteed to be delivered via email. (reference GSFC announcement 03-24) 'E-mails take up to 4 hours to move from one part of the Center to another, in some cases e-mails being lost totally' ▪Most clients poll to receive messages. Polling presents a time delay to receiving message.
<p>• Flexible Robust Architecture</p> <ul style="list-style-type: none"> – GARNET's architecture allows for alerts to be targeted to the affected/interested people. Alert creation includes targeting alert to one or more categories (i.e. bldg.18) and a severity level (I.e. Critical, Informational) Users can control their own subscriptions. Sys Admins can mandate specific subscriptions. –Designed for easy integration with other alert systems ▪Section 508 and NPG2810 compliant –Multiple notification mediums and contingency plan/no single point of failure. –Secure system for internal and external I/F. 	<p>• Inflexible Architecture</p> <ul style="list-style-type: none"> –There is not a method to integrate other notification devices –The system architecture will allow for pre-defined groups of people to receive messages only if a Systems Admin maintain lists. There is not a robust subscription mechanism. 	<p>• Inflexible Architecture</p> <ul style="list-style-type: none"> – Initially a prototyped system that was not originally designed for notification via multiple mediums. Therefore the system cannot notify via multiple mediums without intense redesign and implementation.



General Comparisons



	<u>GARNET</u> <small>(Global Alert Resolution NETWORK)</small>	<u>Leading IM Commercial App</u>	<u>Other Govt Apps</u>
<u>COST</u>	Moderate Cost	High Cost: A COTS product that is available as a 'pop-up' instant message system. \$40/seat,+\$5k/server+20% maintenance	Low to moderate Cost
<u>RELIABILITY</u>	Reliable, obtrusive, and secure: Near real-time alerts can be configured to take over the entire desktop	Reliable and obtrusive	Reliable and obtrusive
<u>FLEXIBILITY</u>	Flexible architecture: Adaptable and expandable	Inflexible architecture	Inflexible architecture: Not expandable without custom development
<u>COMMUNICATION MECHANISMS</u>	Desktop, E-mail, phones, closed-circuit television, pagers, PDA's	Desktop only	Desktop only



GARNET and Commercial Emergency App Comparison



	<u>GARNET</u> <u>(Global Alert Resolution</u> <u>NETwork)</u>	<u>Leading Emergency</u> <u>Alert Commercial App</u>
Costs	Moderate Cost	Moderate Cost: System must be tailored to GSFC and it is anticipated that the system has to design Administrative tools. Moderate cost to deploy and develop administrative tools. No cost for Software implementation, it is complete, but the operational prototype has not been demonstrated at GSFC Invested system cost to date = \$6000K
Reliability	Reliable and efficient	Reliable and efficient
Architecture	Flexible architecture: Adaptable and expandable. Simple, small, targeted application for alert notification.	Flexible architecture: Large complex capabilities focusing on emergency management and accounting
Near Real-Time	Near Real-Time Capabilities GARNET is an effective way to rapidly alert ALL affected people in an emergency in near real-time, whether they are at their desks, in a meeting, in the hallway, or in the bathroom.	Near Real-Time Capabilities The system will be an effective way to contact ALL affected people in an emergency in near real-time, whether they are at their desks, in a meeting, in the hallway, or in the bathroom.
Notification Medium	Unicast Networking, Multiple notification mediums; GARNET can simultaneously utilize multiple notification mediums such as desktop, E-mail, phones, closed-circuit television, pagers, PDA's, etc. Users are unable to use their desktop computers without first acknowledging a critical alert. Critical alerts can not be hidden.	Unicast Networking, Multiple notification mediums; System can simultaneously utilize multiple notification mediums such as desktop, E-mail, phones, closed-circuit television, pagers, PDA's, etc. This system has the ability sent an alert based on GPS location.



GARNET Pros

Pros

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E-Mail Pros/Cons

Pros

- The e-mail system has been an effective way to contact people.
- Most workstations at have some form of e-mail residing on there desktop.
- Since some form of e-mail already exists, utilizing it for an alert system could be cost effective.

Cons

- E-mail must be checked at the user's convenience, which is not effective during critical situations.
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Summary

- **GARNET will equip the GSFC with an flexible and expandable architecture, its support of multiple platforms, and its support of a wide variety of communications mechanisms, GARNET is applicable to not only other NASA centers, but other government agencies, private industry and Universities.**
- **GARNET will not only fill the need that GSFC has to provide rapid alerts to employees during external critical emergencies, but also, provide information to the campus during localized internal emergencies or disasters such as fire or chemical situations on center.**
- **GARNET will provide non-critical alert information to the GSFC personnel during**
 - **dangerous weather conditions such as tornado, storms, snow**
 - **during computer security threats such as viruses, email, network limitations and**
 - **during campus intrusions.**
- **GARNET includes the ability to reach targeted groups at GSFC with time-critical information such as**
 - **Center closure**
 - **FOM messages (lights-on, lost keys)**
 - **Administrative announcements and directives**